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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/836,857	04/17/2001	Seiichi Iwamatsu	12179-P098US	5893

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EXAMINER

VANORE, DAVID A

ART UNIT PAPER NUMBER

2881

DATE MAILED: 06/02/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

09/836,857

Applicant(s)

IWAMATSU, SEIICHI

Examiner

David A Vanore

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 19 April 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-9 and 15-20 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-9 and 15-20 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 17 April 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

***R sponse to Arguments***

Applicant's arguments filed April 19, 2004 have been fully considered but they are not persuasive.

Regarding claim 1, the applicant has argued that Baylor et al. fails to disclose that all of the field emitters in the field emitter array are turned on simultaneously and asserts at page 5 that certain emitters in Baylor will not be activated. The examiner disagrees with this interpretation. Baylor et al. clearly teaches the opposite of what is asserted at Col. 7 Lines 54-68. For example, Baylor et al. states that "Turn on, or turn off, of the entire field emitting array 445 is achieved by switching the bias grid 440 from negative to positive.... It must be noted now that an individual bias can be applied to each of the emitters." So it is clear that while the applicant asserts that Baylor et al. must have emitters that are not on, Baylor et al. in fact teaches that individual emitters can be turned on and off on an individual basis without making the requirement asserted by the applicant. Therefore, since each of the field emission means of Baylor et al. are turn on or turned off in unison or are individually controllable, applicants arguments regarding claim 1 are not found persuasive.

Regarding claim 4, the applicant has argued that Item 520 is not a conductive means but is a logic and memory circuit to control each emitter. Baylor et al. controls each emitter by applying an individual bias to each emitter through item 520. Since item 520 is admittedly a circuit, and is the means by which the device of Baylor et al. conveys an electrical signal to an emitter to control the function of said emitter, item 520

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must necessarily be conductive in nature. Therefore, applicants arguments asserting that Item 520 is not a conductor are not persuasive.

Regarding claim 6, the applicant has argued that grid 440 is not deposited on the substrate and defines "on" as to be positioned over and in contact with the substrate. The examiner draws the applicants attention to Fig. 5. Referring to the example of the word "on" tendered by the applicant, the examiner is giving reasonable and ordinary meaning to the word "on" in this case. For example, to take the example at page 6 of the response further, "the book is on the table", and "the table is on the Earth", therefore, "the book is on the Earth." The same is clear in Baylor et al. The grid 440 is deposited on the hatched layer, and the hatched layer is on the substrate 510, therefore the grid is on the substrate.

Regarding claim 5, the applicant asserts that Park fails to disclose a substrate. Item 6 in Park is a substrate.

Regarding claims 7 and 8, the applicant has asserted that the modification of the shape of the emitters and grid elements is not an obvious modification to one skilled in the art in view of a broad statement that emitters and grid elements can be of any shape. Baylor et al. does not make a statement as broad as that which the applicant asserts. Baylor et al. teaches that a modification of the shape of the emitters and grid elements is within the ordinary skill of one in the art after having knowledge of the invention disclosed in Baylor et al. and where a suitable emission field is produced. Claims 7 and 8 recite a change of the shape and configuration of the grid elements and emitters of Baylor et al. and necessarily produce a suitable emission field if electron

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emission occurs in the practice of the invention. Therefore, since the claimed invention meets the two requirements set forth in Col. 8 of Baylor et al., a modification of the shape of the emitters is an obvious modification because Baylor et al. clearly teaches that a change of shape or configuration of the grid elements and emitters is an obvious modification.

***Claim Rejections - 35 USC § 112***

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 15-19 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. The newly introduced negative limitations are not supported by the original disclosure and therefore constitute new matter, where the negative limitations specifically are as follows:

In claim 15, "when the electric field is established there is no de-activated field emission material"

In claim 16, "wherein it is not possible to de-activate selected portions of the field emission material."

In claim 17, "de-activation of selected portions of the field emission material is not required to define the predefined pattern."

In claim 18, "wherein the field emitter is not matrix-addressable"

In claim 19, "wherein the electron beam resist layer is not modified in the spaces between the predefined pattern since no field emission of electrons occurs in such spaces."

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-4, 6, and 9 stand rejected while claims 20 is rejected under 35 U.S.C. 102(b) as being clearly anticipated by Baylor et al.

Baylor et al. teaches an electron beam lithography apparatus comprising a first substrate (Fig. 5 Item 510) having electron field emitters (431, 432, 433, 434) positioned there above with an electric grid circuit (440) to control the emission of electrons from the desired emitters. Baylor et al. further teaches a second substrate (350) having a resist coating thereon which electron beams are impinged on to form a desired pattern as recited in claim 1. See Baylor et al. (Col. 3 Line 44 – Col. 4 Line 25.)

Wherein the electron emission material is deposited on the first substrate in a predefined pattern (Fig. 5 and Col. 5 Lines 55-68) and where the emission material emits electrons on a continuous basis when activated (Col. 7 Lines 54-68).

Fig. 5 also clearly shows that there is no emission material in between emitter array elements (431, 432, 433, etc.).

Regarding claims 2 and 3, Baylor et al. teaches the use of magnetic and electrostatic field lenses (463, 467, 470) between the first and second substrate to focus the electron beams.

Regarding claims 4 and 20, Baylor et al. further teaches a conductive layer between the first substrate and the field emitters. The conductive layer (520) controls electron emission and is in contact with first substrate 510.

Regarding claims 6 and 9, Baylor et al. teaches a conductive material deposited on the first substrate between field emitters (441, 442, 443, 444), which is positioned such that the emitter is recessed below the surface of the conductive material.

Regarding the amendment to claim 1, the field emission means (431) are active field emitters disposed on the first substrate in a predefined pattern. Baylor et al. does not indicate that these emitters move, therefore they are positioned on a permanent basis. Further, when a current is applied to said emitters, they continuously emit electrons. Looking to Fig. 5, no active material lies outside the pattern, since it necessarily defines the pattern, meaning that there is a space between boundary material 441 and emitters 431. Since no emission material lies between 431 and 441, no electrons are emitted from this space between them, again see the emission lines coming from 431.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 5 stands rejected under 35 U.S.C. 103(a) as being unpatentable over Baylor et al. in view of Park.

Baylor et al. teaches all limitations as applied above but fails to teach a second substrate positioned a distance from the emitter substrate having a conductive layer implanted therein between a substrate layer and a resist layer.

Park teaches a lithography device in which the target of a lithography beam of electron radiation is a second substrate positioned a distance from a field emission means with a layer of conductive material deposited between the second substrate and a layer of resist (Col. 2 Lines 3-28).

Modifying the device of Baylor et al. with the device of Park would produce a field emitting array electron beam lithography device whose target is a wafer having a conductive layer implanted therein between a substrate layer and a resist layer.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to supply a substrate having a conductive layer interposed between a substrate layer and a resist layer because the layering of conductors and resist on a substrate allows the process of semiconductor manufacture to be accomplished where



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an electron beam reacts with the resist, selectively exposing the conductive layer during the development process to allow fabrication of a desired circuit on a substrate.

Claims 7 and 8 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Baylor et al.

Baylor et al. teaches all limitations as applied above but fails to teach a conductive material which cover the edges of the field emitter as recited in claim 7 or where the conductive material is coplanar with the emitting surface of the field emitter as recited in claim 8.

Baylor et al. does teach that it is within the level of ordinary skill in the art to provide a conductive layer such as in claim 6 of any shape so long as a suitable emission field is produced (Col. 8 Lines 40-45).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to provide a conductive material which cover the edges of the field emitter as recited in claim 7 or where the conductive material is coplanar with the emitting surface of the field emitter as recited in claim 8 because Baylor et al. teaches that the conductive grid disclosed in the prior art would be fashioned into any desired shape.

### **Conclusion**

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

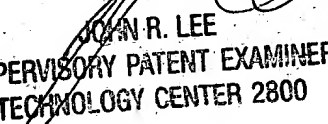
Any inquiry concerning this communication or earlier communications from the examiner should be directed to David A Vanore whose telephone number is (571) 272-2483. The examiner can normally be reached on M-F 7:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John R. Lee can be reached on (571) 272-2477. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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